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ABSTRACT

An assessment of educational game playing in the classroom is presented. The assessment is based mainly on observations and reports of the game Empire (Educational Services Incorporated). In separate sections of the report, the author considers arrangements for game playing, the motivational appeal of educational games, and how and what children learn from games. The expenditure of time and money and the utility of educational games are also considered. Six reasons for the motivational appeal are: the classroom routine is interrupted; children are encouraged to talk to fellow students; children like the manipulative aspects of games; children like to win; game playing is a familiar and non-threatening activity; and not much reading is required for participation. In discussing intrinsic and extrinsic learning from games, the author points to problems of misleading the child through falsifications and oversimplifications of the reality the game is intended to portray. Conceptual and factual learning is also examined. In addressing these problems, the report stresses the necessity of game design and teacher follow-up. The author concludes that games are most useful at the junior high level and are least successful with bright students. (KC)

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Occasional Paper No. 9

The Game of Empire

A Partial Assessment with Some Comments on Other Teaching Games

BY

PETER WOLFF

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The Social Studies Curriculum Program

Educational Services Incorporated

Introduction

One of the most interesting new tools for teaching is the employment of games. While skits and role plays have long been used in the classroom, the employment of actual competitive games for teaching purposes is a recent development; consequently not much is as yet known about the actual utility of these devices. Since Educational Services Incorporated has quite frequently included games in its new teaching materials, it seemed appropriate to attempt an assessment of the results that game playing has so far produced in several schools.

Mr. Wolff is the editorial director of the Social Studies Curriculum Program.

September, 1966

The Game of Empire

by Peter Wolff

In "Games for Learning"[1] Clark Abt discussed the theory underlying the use of games for teaching and learning and gave brief descriptions of some of the games which he and his staff at Abt Associates Inc. prepared for the Social Studies Curriculum Program of Educational Services Incorporated. The following remarks are based on a series of observations of classrooms while games were actually being played, together with an evaluation of reports by teachers who have used games developed by Educational Services Incorporated.

By far the greatest number of observations that I made were in classes playing "Empire," a junior high school game dealing with mercantilism and trade regulations in the eighteenth-century British Empire. Furthermore, I examined written reports from approximately 50 teachers who had played "Empire." I also visited a few classrooms playing "Adventuring" and an as yet unnamed game dealing with the Restoration Period in England. These two games are also meant for the junior high school years. I also visited two classrooms playing "Trade and Travel" (another junior high school game) and received reports from five teachers whose classes used "Trade and Travel." In addition I acquainted myself somewhat with several games meant for the elementary years, as well as with one game ("Steam") designed for senior high school students.

The overall impression I received is that the games were very well received by both students and teachers. Both groups seemed to look forward eagerly to periods of playing. This reaction must, of course, be viewed with a certain amount of caution. No doubt there was considerable eagerness on the part of both students and teachers to be involved with something new; besides, participants may have given the kind of answer which they thought I wanted to hear. Still, there is an impressive amount of evidence pointing to the willingness of teachers, principals, and superintendents to try out teaching games and to the

[1] *Occasional Paper No. 7*, The Social Studies Curriculum Program. Cambridge, Massachusetts, 1966: Educational Services Incorporated.

ability of students to learn from them. I shall try to support this impression with some facts based on observations, while also taking account of some of the difficulties and problems that appeared in the actual use of games.

Arrangements for Game Playing

A classroom in which a game is going on presents an appearance of considerable confusion. In the case of "Empire" (and most other games as well) the entire class is divided, as evenly as possible, into teams. In "Empire" six teams represent competing interest groups, and an additional team ("British Navy" or "Admiralty Customs") supervises trade and shipping; thus there are seven teams of from four to five children each who play. Since "Empire" (again like many other games) is highly competitive, each team of children must sit together and be separated from the other teams. The classroom, therefore, cannot contain "orderly" rows of seats with all children facing the teacher at the front of the room; tables and chairs must be grouped to permit members of teams to sit together and to consult with one another. In the game of "Empire" there must also be a central place for a very large map (of what would nowadays be called the North Atlantic community) which constitutes the game board. In some classrooms this map was placed on the floor, this being the only available area large enough to accommodate it.

Other games, such as "Trade and Travel," are designed so that they are best played by only a small number of players (five, in the case of the travel game). In "Trade and Travel" the object is to discover the least time route between two points in England and then to travel this route while encountering chance hazards such as might have befallen a seventeenth-century traveller. This game, therefore, is designed to teach something about the length and difficulty of travel in seventeenth-century England as well as to give the children some notion of the general geography of the country.

Because this game involves only five players and no complicated apparatus, some teachers have found it best to have several games going on simultaneously in the classroom. This eliminates the need for teams and allows each child to compete and have an opportunity to win on his own. (Since there are

bound to be four losers, no special stigma is attached to losing.) Because each child plays for himself, his motivation and his learning opportunities are greater than if he is part of a team, unless he is a child who cannot learn at all without help from others. Having four or five games going on simultaneously in one room makes, of course, for a fair amount of noise and confusion, even though "Trade and Travel" is a much less noisy and active game than "Empire."

It may be assumed, then, that all games create noise and produce an unorthodox classroom situation. There is, however, a great range between different schools: one classroom in New York City required a police whistle to penetrate the din, while a class in Quincy, Massachusetts was so well-disciplined that there was almost no perceptible increase in the level of noise. (Both of these were extremes, of course.) The important point, however, is this: the noise, confusion, and tumult are not just things to be put up with and if possible minimized; on the contrary these are necessary and perhaps desirable conditions of game playing. It is because of the unusual classroom situation, the freedom of movement given to students (which results in shoving, pushing, yelling, and so forth), because of the absence of usual restraints, that games appeal to children and promote (at least in part) their learning.

The Motivational Appeal of Teaching Games

Indeed the clearest and most obvious reason for teaching by games is that the classroom activity they induce has a great appeal for children. There are a great many reasons for this appeal; let me list some of them, beginning with those mentioned just above.

(a) The classroom routine is interrupted. This itself pleases the children, indicating that perhaps one of the major factors holding back learning is mere boredom with school. (The reasons for the boredom may be different for bright and for dull children, but both kinds experience it.)

(b) The children are encouraged (indeed, required) to talk to their fellow students, instead of the usual rule of silence being enforced. This not only helps to relieve boredom but also gives the children the idea that their conversation may be of some value, when it is addressed to other children. Usually, the major

impression received in school is that only teacher-oriented speech is worth anything.

(c) Children like the manipulative aspects of games. They like to handle the game pieces, and they like the feeling that they "own" some of the equipment (such as play money, and—in the case of "Empire"—ships and goods). This factor may be less important with older students, but it is still definitely operative for junior high school children.

An interesting sidelight on this aspect was provided by a class of seventh graders in New York. These were economically and culturally deprived children (although the region where they live is far from the worst in New York City). These students responded well to the fact that the teaching materials of "The Emergence of the American" (the unit to which "Empire" belongs) were handsomely designed. They also clearly liked playing the game and all the concomitant activities. But what was most striking was this: Each of the six teams in "Empire" receives two small, transparent plastic boxes; one to hold the goods which the team has to sell, the other to receive the goods which it purchases. The boxes are divided into little compartments and can be closed with a hinged cover. Altogether, these are very ordinary boxes; nevertheless, the children in New York evidently considered these boxes to be precious and unusual. Within two hours all of them disappeared from a game box that was left open for display purposes; this appeared to be the only thing which the children coveted. I would guess that to many of the children, these plastic boxes had the character of toys such as they had never been able to handle before. While this is surely an extreme example, probably even children from more privileged economic backgrounds derive some pleasure from handling well-designed game "hardware."

(d) Children like to win, especially if the game seems fair. This is largely the case, I think, because winning is an easily and well understood goal. Whereas many other classroom situations confuse a child because he does not understand what is expected of him (and he desperately tries to obtain clues from the teacher's behavior or from his fellows as to what he is supposed to do and say), the child understands what is wanted when he is told to try to win (to make as much money as possible, for example, in "Empire"), even if he does not always understand how to go about it.

An occasional exception to this rule can be observed. During the late junior high school years (and probably in the senior high school years), some girls do not like to compete with boys and do not care about winning (in this way). This is especially apparent when the normal distaste of girls for competition with boys is reinforced culturally. Thus, to return to the example of the children from New York, Puerto Rican girls there seemed especially reluctant to challenge the boys.

Because children like to win, it follows as an obvious corollary that they will object to unfair games. Thus it is important to arrange things so that each player or each team has an approximately equal chance of winning. However, if a game – such as "Empire" – tries to simulate an historical situation, a certain amount of "rigging" is inevitable. For example, children who play "Empire" often complain that too many ships are sunk or that too many are seized by pirates; yet the probability of these events happening has been based on historical facts. Again, because mercantilism "rigged" trade in the British Empire in favor of the London Merchants, the game "Empire" is similarly rigged. Fortunately, there are several reasons why this does not take away the children's incentive to play: first, the mercantile system, though it favored the English merchants, also offered opportunities for profit to other interest groups in the Empire. Unless this had been so, the various colonies would not for long have put up with this system. This is faithfully reproduced in the game: it is possible for any of the teams to make a killing. Second, individuals in the eighteenth century (and some teams in "Empire") found it possible and profitable to circumvent the mercantile rules by smuggling; they were (and are) able to "beat the system." Third, the system of scoring evens out the inequities: since the winner of "Empire" is not the team with the largest riches at the end, but rather the team that has increased its wealth the most, it is possible in the game of "Empire" for a team to win even though its actual gains are very insignificant.

Even more importantly, it seems likely that children will not like games that are deliberately "rigged" or made unfair, in order to elicit from them an emotional response, such as anger, surprise or resentment, similar to the emotional responses which an unfair real-life situation might elicit. It seems likely to me (although I have observed only a few instances as yet) that chil-

dren will resent a game the main purpose of which is to show them they cannot win.[2]

The junior high school unit dealing with the English Civil War at present contains a game (called "Revolution") which is rigged against most of the players. As the game proceeds most of the players have things done to them, by King Charles I and his advisors, which damage them, financially, politically, or morally (in the sense that they are required to act against the dictates of their conscience). It turns out that there is no machinery for doing anything about these grievances; the more the players try to undo some of the unjustified events happening to them, the more of the same kind takes place. The hope of the game designers is that the players (i.e., the children) will get angry and will realize that this is similar to what must have been happening to Englishmen in the sixteen-twenties and thirties, and that grievances which cannot be ameliorated may easily lead to revolution. Since this game has not yet been tried out with children, no evidence exists as yet as to whether it lacks the motivational advantage of games.

(e) Children feel secure in game playing, because the activity is familiar (all children play games) and non-threatening. This point is closely related to the previous one. Because the children know what to do, know what it means to win, and are naturally motivated to try to win, they plunge into game activities with great enthusiasm. The other side of this coin is that when the children discover – as they do in some learning games – that a considerable amount of reading and of work is required, they easily become disappointed in the game activity: it turns out not to be all "fun" after all.

(f) In the previous paragraph, I have already touched on

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[2] At one time, we briefly contemplated a "slave" game as a supplement to "Empire." This game was supposed to confront the students with the moral problems of slave trade. We thought it might be useful to familiarize the children with the horrors of the middle passage in order to make the problem real (and therefore important) to them. On reflection, however, we decided that this was probably damaging to the children, especially Negro children. Not only was the game fatally rigged (the closest a player could come to "winning" was merely to survive through several rounds of playing ending up as a slave), so that no child could experience any real pleasure of winning, but it also seemed that playing the game could contribute to a low self-estimate by Negro children. The game was never tried out, therefore; we felt that the moral problems of slave trade could better be dealt with in some other, non-game fashion.

an important point which disposes children favorably toward learning by games. There is (or there at least appears to be) not much reading required to participate in games. Though the children know that games have rules and that rules are usually stated in writing, they also know that game rules are usually learned by playing rather than by reading and they quite properly expect to do so with teaching games. (In fact, one of the worst mistakes a teacher can make is to go through the rules laboriously, step by step, before starting to play. He will bore himself and the children, and probably neither he nor the children will know how to play the game anyhow.)

Thus a game shares with audio-visual materials the advantage of avoiding children's reading problems. To the extent that reading *is* required, as in the contract forms for "Empire," the trip cards for "Trade and Travel," or the career cards for "Adventuring," games encounter the same resistance from slow readers as other materials do, although in a team-game a non-reader can often obtain needed information orally from his teammates.

How Do Children Learn by Games?

In the answer to this question I am not looking for a theory of learning by means of games, but merely for the practical devices that are or should be built into games so that the players can learn from playing. Basically, these devices fall into two kinds: (a) intrinsic means and (b) extrinsic means.

(a) By intrinsic devices I mean those which are a "natural" part of the game and perform their teaching function simply if the game is played. For example, if chess were a teaching game, then it would teach certain things to a player because he could not help learning them while he learned the rules of chess and played the game. Chess teaches a player that in a battle order, the king is the most valuable piece (in the sense of requiring protection at all costs), while the queen is the most potent offensive weapon. Chess would also seem to teach that in a battle it is more valuable to have two bishops on your side than two knights (since the former two can mate a king while the latter two cannot). This information may be amusing as illustrating certain ecclesiastical prejudices concerning the importance of secular and church power; it is also a good indication that many games teach misinformation. Chess, of course, is not a teaching game, but it

may be well to realize that its "incidental" teaching capacity is quite severely limited. Other games devised for entertainment, such as Monopoly, appear to teach as well as to entertain; but again, it is likely that most of the information imparted is totally or partially false. From playing Monopoly, for example, a player might learn that the only area where monopolistic practices are common is that of real estate speculation; in fact, this is one of the least likely places for monopolies.

Chess and Monopoly, of course, do not claim to be teaching games, so that we cannot blame them if their rules are arbitrary and do not reflect reality. These examples do, however, point out a danger which teaching games are subject to: their rules may misinform the children. Let us examine a couple of games from this point of view.

Much of "Empire's" teaching ability is intrinsic. The way in which the game is set up teaches (or should teach) about such things as the Navigation Acts, smuggling, mercantilism, and the role of the British navy in eighteenth-century trading. For example, the colonial trading teams in "Empire" are forbidden to sell many of their products to merchants outside of the British Empire. This restricts the ability of the American colonist teams to make money, and is a direct reflection of the actual Navigation Acts. Presumably, a child will learn what the Navigation Acts are all about, how they affected the American colonists and how they affected the British merchants, simply by playing the game.

Similarly, in the "Trade and Travel" game, the children will learn from planning their routes, that it was not possible to travel from Cambridge to Canterbury in seventeenth-century England without going through London. This in turn should teach them (without anything even being said about it) that London occupied an important and central place in England.

In "Adventuring" each male player chooses a career for himself. The rules provide, however, that the eldest son in a family has no true choice but *must* choose the same career as his father; this rule acquaints the children with one of the factors which restricted social mobility in seventeenth-century England.

In "Steam" the players have to set a price on coal which they wish to sell. Their costs in producing the coal depend on (1) how much water they have to pump out of a mine shaft and (2) whether this pumping is done by hand or by means of a steam engine. Here the game teaches the children that a steam

engine is very expensive to purchase but that it enables them to bring down the cost of producing coal.

It seems quite apparent that these intrinsic teaching devices are very effective, because they promote learning without pain. The child, eager to win, will acquaint himself with the rules of the game and so, willy-nilly, acquires knowledge. One teacher in fact reported that her slow students suddenly realized that they were learning something while they were having fun in playing "Trade and Travel."

It is also quite clear that the child can be seriously misled, however. I have already pointed out how games that are designed for amusement may mislead the players if they are interpreted as giving factual information. The matter is more serious with teaching games, however, where deliberate falsifications sometimes have to be introduced in order to keep the game simple enough to be playable. For example, in "Empire" there is no provision for insurance on the ships or their cargo, simply because this would introduce more paper work and make the game intolerably lengthy and complicated. Although this is a sufficient reason in my opinion for omitting insurance, it should be pointed out by the teacher that insurance was in fact sold during the eighteenth century and arose just because of situations such as those in "Empire." Unless this is done, the child "learns" that during the eighteenth century it was not possible to protect ships and goods against shipwreck and piracy.

The omission of insurance merely fails to teach something; but there are more serious errors. In "Empire" all trading is carried on by ships, even the trade between adjacent teams on the North American continent. If the Colonial Farmers sell something to the New England Merchants, the goods (in the game) have to be transported by ship. In making this journey, the ship is subject to all the same hazards as a ship going across the Atlantic Ocean (though not as intensely, because the journey takes only one-third as long). Again, this feature of the game was introduced in order to make it simpler and more uniform; if land travel as well as sea travel had to be included in the rules, the complications would have been formidable.

Perhaps the most serious distortion in "Empire," from the historical point of view, is the permissibility of direct conversations (relating to buying and selling) between teams which geographically are thousands of miles apart. The Southern Planters

team, for example, is permitted to discuss possible trades with the European Merchants team. In an initial version of "Empire" we planned to have such trading carried on by letters which would have to be sent across the ocean. It would take some time, of course, for these letters to reach their destination. (We even had a formula: 2 minutes of play time = 1 week of real – historical – time.) Once more, this provision turned out to make the game unplayable; most of the classroom time was taken up by letters going back and forth, without any trades being consummated. Still, the realization that trade in the eighteenth century was complicated by the fact that instructions took weeks to get across the ocean is certainly an important one for the children to get; to "teach" them that communication was practically instantaneous is to misinform them seriously. We depend on another part of the Colonial Unit, a pamphlet dealing with an actual New England trading firm (Joseph Lee & Co. of Beverly, Massachusetts) to show the children how large the communications difficulty loomed. Joseph Lee has to give instructions to Captain Burchmore which anticipate possible contingencies:

> . . . we direct you to proceed immediately for Charleston, South Carolina, and there make sale of our rum if the market should be such as to pay the original cost and charges; but if otherwise, and you judge it prudent to proceed to Winyah Bay, South Carolina, for the benefit of getting rice cheaper, reserve twenty-five barrels of rum to carry with you. . . .[3]

The question remains, of course, which impression will be left more strongly in the student's mind: what he gathered from the game (which comes first and has the motivational advantage) or what he read in the pamphlet? It is well to keep in mind these necessary oversimplifications and possible falsifications when assessing the teaching potential of games.

A similar problem, which has been raised by a few teachers, arises from the fact that some games seem to teach and encourage immoral behavior. Thus, in "Empire" not only is slave trading a regular part of the game, but the rules also explicitly countenance and encourage both bribing and smuggling. Many teachers are not satisfied with the explanation that all of these activities were in fact part of eighteenth-century commerce;

[3] *The Emergence of the American*, Part IVC. "The New England Merchant: Joseph Lee and Co.," p. 2.

they feel that having them in the game gives the appearance that it is morally all right to engage in these doings. Actually, all the children should learn is that slavery, bribery, and smuggling were integral parts of trading, but the teachers apparently feel that including them in the game gives a kind of school seal of approval to these activities. A good teacher will, of course, seize the opportunity to discuss all of these things and question their moral rightness with the children. Less adept teachers, who are afraid to have the children know about these activities, reveal by this very fact one of the causes that estrange children from school: school is a place in which *real* situations and problems (including ugly ones) are not to be discussed; school is a sort of never-never place in which children are forced to pretend that reality as they know it (especially if they are city children) does not exist. Children do in fact know a great deal about dishonest behavior; they understand it. For example, some children playing "Empire" tried to win by actually stealing cargo chips from competing teams. Certainly they should be stopped from doing this, but it is nonsense to imply that this sort of behavior was caused by the game. The children obviously had been used to stealing long before; actually "Empire" would give an opportunity to raise questions about this and similar behavior.

(b) Extrinsic teaching devices are not subject to the problem of oversimplification, simply because they are not essential to the playing of the game. Consequently, these devices may be as simple or as complicated as we please.

For the most part, these devices consist of bits of information which are distributed through the game in such a way that, the game designers hope, the children will absorb them even though it is not necessary to do so in order to play. A common device is to put instructions for the next move on a card and then to add, on the same card, some additional information not related to the move. The hope is that the child, because he has to read the card in order to know what to do next, will go on and also read the further text which will furnish him some desirable information.

Thus, in "Trade and Travel" each player at each move turns over a card, which either says "Make A One Day's Journey Safely" or else give reasons why the player is delayed. In addition to these instructions, each card also contains some information about seventeenth-century England, for example:

> In 1693 a special act offering a reward for the apprehending of highwaymen was passed, so severe had the danger become. Anyone capturing a highwayman who was later convicted was to be paid a reward of forty pounds.

In "Adventuring" the players have to pick careers which they think will further their fame and fortune. There are 28 different kinds of careers, having decided on one, the player then draws a card from a group of about ten describing what happens to a person choosing that kind of career. Suppose that a player decides to become a merchant in the Baltic Sea area. He picks a card from the "Merchant, Baltic" pile which may read as follows:

> You get a contract supplying salt beef and biscuit to the navy. Since Cromwell's government, unlike that of Charles I, pays its bills, you make a fortune.

What the player needs to know for purposes of the game, then follows:

> Gain: £2,000 plus an estate.

The game designers hope that the children will learn something about the fiscal policies of Charles I from this card.

In "Empire" most of the teaching results come from intrinsic devices, although there is some incidental information extrinsic to the game which the children probably will retain. (For example, the relative cost of different kinds of goods in the eighteenth century.)

It takes but little observation of games being played to make it apparent that extrinsic teaching devices do not work very well. At first, the children (especially good readers) will read everything that is on a card, but after very few moves they discover what it is that matters for the next move and from then on they simply read that portion of the card. The more they get caught up in the game, the more interested they are in winning and the less they care about extraneous information. For slow readers, the added information may be an actual handicap, because they may never get to the text that tells them what to do. They will either be unable to play, or will at least be discouraged by the amount of reading they have to do.

What Do Children Learn from Games?

Children can learn both facts and ideas from games. As

usual, it is easiest to identify the facts which a child might and does learn. In "Empire" the children easily and surely learn the various goods which a given trading area had to sell (lumber from New England, tobacco from the Southern colonies, and so forth). Almost all the teachers emphasized this aspect of the game and seemed pleased that the children learned about the economic situation of different areas. Much rarer were the occasions when children g asped some of the basic assumptions underlying the system of trade represented in "Empire": that colonies should be kept as sources of raw materials, while manufacturing should be carried on in the mother country; that the benefit of trade to England could be measured directly by the amount of cash flowing into England; and so on.

Most of the latter notions are, if not demonstrated, at least suggested by the rules of "Empire," i.e., by the intrinsic structure of the game. Nevertheless, the children did not, by themselves, seem to grasp these notions; perhaps it is better to say that they were not interested in them. It was possible, however, to get the children to understand these ideas in a discussion of the game. For example, the question "Was this a fair game?" elicited answers from the various team members which made it possible for them to see how the mercantile system operated and why it was rigged the way it was. Ideally, of course, the children would have seen all this even without a class discussion, but in actual fact it seems that they become too involved with the immediate problem of winning to pay any attention to underlying ideas.

Beyond this, there are some other questions which ought to be raised by the teacher after "Empire" has been played and which the children at least ought to try to answer. Many of these questions involve value judgments. Thus the children should certainly have been prepared by the game for a question dealing with the morality of slavery. (Slaves are traded in "Empire" like other goods.) Furthermore, they probably should consider the illegal trade which is one of the options in the game. How do they feel about the propriety of such smuggling? Whether they condemn it or approve it, they certainly should be made to think about the reasons for it. Finally, the game naturally raises the question of whether membership in the British Empire was advantageous to the colonists and whether, therefore, they were likely to revolt against the governing authority.

All of these are interesting questions and valuable to have raised. "Empire" seems to provide an excellent occasion for having them considered in a junior high school class. However, these questions will seldom arise *automatically;* unless the teacher makes a deliberate effort, the opportunities for discussions of the various topics mentioned will simply be lost. It is hard to overemphasize the importance of a "de-briefing" or discussion session after the game has been played. Without such discussions, much of the value of "Empire" will be lost. The same is true of other games I have observed; it is probable that it applies to all games. Without a class discussion about seventeenth-century England, "Trade and Travel" will be just another board game, not too different from Parcheesi or dozens of similar games. In "Adventuring" the notions of social stratification, of social mobility or rigidity, of the relative importance of birth and money in a society are there to be explored by the teacher who takes advantage of his opportunities. If, however, the teacher fails to follow up these games, it is likely that the benefit to his students will be very small indeed.

Thus there are several possible answers to the question of what students learn from games. One possibility, which must be acknowledged, is that the students may learn nothing or almost nothing from them. This will be the case if the teacher does not capitalize on the teaching possibilities which a game offers him. If the teacher expects a game to do his instructional job for him and does nothing on his own, his students will gain nothing or very little. Even worse, the students may learn wrong things because of the falsifications which, we saw above, are built into any game.

Fortunately, a more likely result is that the students will learn quite a lot from their playing of games. How much learning there is will depend on how much the teacher does by way of follow-up and on how well designed the game is. In playing, the children will become familiar with the structure of the game; thus the more information there is to be derived from the structure of the game, the more learning there can be expected to be. Relatively little information will be derived from extrinsic devices of a game; even if a child learns something from one of these devices, it is unlikely that he will long remember it.

What is more interesting and important to discover, of course,

is whether children can learn concepts from games. Here the evidence seems to show that a well-designed game can be extraordinarily helpful. Difficult abstract notions can be made concrete for children by means of games. Such ideas as "mercantilism," "social stratification," and "revolution" can gain reality for children when they are attached to concrete happenings in a game. It is unlikely that "denial of redress for grievances" or "perceived incompetence of government" will mean much to seventh or eighth graders; yet it is very likely that after participating in the simulation game "Revolution" they would understand what these ideas are, though they would not, of course, use the above phrases to describe them.

Since so many ideas in the fields of social studies involve social interaction, games seem to be an excellent method for getting students to cope with them. In "Steam" the law of supply and demand can be seen operating; furthermore, the notion that increase in productivity depends on technological advance is illustrated. Both of these ideas can be explored by means of the game more readily than by merely reading about them. In one of the earliest games designed for ESI, "Hunting," the idea of cooperation between hunters in order to obtain food more surely than if each man hunted alone becomes apparent. The children (fifth graders) see that a hunter may trade off the opportunity for an occasional big kill (which he would have for himself alone) for the likelihood that he will always have some food even if he himself fails to kill any game. Even the idea of the duality of patterning in human language has been incorporated into a game ("High Seas") in order to make it concrete and understandable by young children.[4]

The evidence that children do in fact learn concepts from games is, so far at least, largely subjective. It is based primarily on actual classroom observation together with (subjective and anecdotal) classroom reports by teachers. An "objective" test was given to many students who had played "Empire," but it mainly tested factual knowledge. We have already mentioned earlier that the question "Was 'Empire' a fair game?" gave rise in one group of children to responses that showed the children

[4] It should be added that neither "Hunting" nor "High Seas" are at present included in the materials being prepared for elementary school children.

either understanding or on the threshold of understanding such concepts as "balance of trade," "monopoly," "protectionism," and "mercantilism." The judgment that these concepts (though not necessarily those words) were meaningful to them is based on the kinds of questions they asked and the kinds of change which they wanted made in "Empire," in order that their particular team would have a better chance of winning. In another class, some children suggested that the best way for the various colonial teams to make headway against the London Merchants would be for them to band together. It is not too far-fetched to maintain that these children were thinking about a possible cause of the American Revolution. Sometimes the fact that the children discover how to win at a game is an indication that they have understood some basic concept: thus, in "Steam" most children quickly realize that in order to win (which means mining the most coal at the least cost) they must purchase a Watt steam engine, because this machine removes water from a mine shaft at the least expense per quantity of water. In "Trade and Travel" a child who has correctly chosen the least-time path for his assigned trip, has understood several important mathematical concepts, as well as some geographical notions.

At the same time, a teacher should realize that not all concepts or facts that interest *him* are necessarily included in any one game. Thus, a fairly common complaint of teachers about "Empire" has been that, try as they would, they could not get the children to see the "triangle trade" in it. This merely reflects the teachers' view that this is what children should learn about trade in the eighteenth century and that this is one of the important facts concerning slavery. "Empire," however, was designed not to teach about slavery or the (alleged) triangle trade, but rather about mercantilism and about the influence that economic factors had on the movement "from subject to citizen" (the name of the eighth grade course to which the Colonial Unit and the game of "Empire" belong).

Though the evidence is admittedly spotty, it seems to me definitely to point to the conclusion that the teacher who is interested in teaching structure and concepts (which means all good teachers) rather than factual knowledge, should welcome games as teaching devices, as long as he realizes that his own active cooperation is going to be required in order to realize the teaching potential which these games have.

The Expenditures of Time and Money Required by Games

What kind of expenditure is required for a teaching game to operate successfully? (The cost I have in mind is measured not only in money but also in time that must be spent.) Conversely, what do teachers and children obtain for this expenditure?

The cost can be analyzed into three parts. There are *first* the research and development costs, which will probably be borne by an institution such as ESI, or else by a commercial house which develops games for profit. *Second*, there are the actual production costs of the "hardware" items for the game — board, pieces, play money, or whatever is required, together with instructions for students, teachers, and any other written material that may be needed (supplementary reading, tests, and so forth). *Third*, there is the expenditure of time and effort by the teacher who uses the game in his class.

We must also take into consideration the use of the children's time in playing a game. If a certain amount of instructional time is devoted to a game, are the children profiting (i.e., learning) from this? Are they profiting from it more than they would by the same expenditure of time in more conventional instruction? There is a further question of whether children who have played a teaching game will continue to learn from other teaching games, or whether the utility of games decreases as greater and greater use of them is made. Such decreasing utility (if it were found to exist) might indicate that the initial success of games was due to their novelty in the classroom (i.e., was an instance of the so-called Hawthorne effect) rather than to some intrinsic advantage which they possess over other teaching materials. As the novelty of games wears off with increased usage, it should become apparent whether their success with children is a temporary illusion or a permanent phenomenon.

Let us consider these points one by one. There can be little doubt that the research and development costs for games are high. All experience shows that a game cannot be developed overnight but requires a minimum of several months' work. "Empire" is still being revised, although it has been worked on for over two years (not continuously, to be sure). The development of a game requires first that someone sees a way of putting something which it is desirable to teach into game form. That

is, someone must see that some set of ideas (or facts) can be taught in a contest situation, where the contest is regulated by a small number of easily definable and unambiguous rules. Then the contest must be precisely defined, the competing parties or teams identified, and the rules made explicit. When things have gone this far, it is necessary to try the game out. The first try-out probably will not concern itself with the teaching possibilities of the game, but rather with the mere question of whether the game "works." Do the rules cover all contingencies? Is it always clear what a player can do next? Is it possible to determine a winner of the game? If the game seems to work in this mechanical way, then it is time to try it out with children. Again, the first question will be whether the mechanics of the game permit it to be played in a classroom. Is the equipment suitable? Can the children handle it? Can the classroom be arranged to let play go on? Can game equipment be properly stored? Can it withstand the special punishment which children give it?

The second and much more important question (but one which cannot be answered until the first one has been disposed of) has to do with whether the children are learning something from the game, whether what they are learning is factual information or whether it is conceptual, whether what they are learning is important, and whether they are learning that which the game designer wanted them to learn.

As a result of testing a game in a classroom and trying to obtain answers to these questions, it is likely that revisions will have to be made in the game. The revised version in turn will have to be tested out. It is necessary to go through the entire process again, because it is possible that in "improving" the game, we may inadvertently have added errors or may have made it unplayable for technical reasons. (This is not an idle fear; it has in fact happened with some games.) It is this lengthy process of testing, changing, and re-testing which makes game development costly. It should be added that in this respect, however, game development is no different than development of any new teaching materials.

As far as the actual production costs of a game go (and these would certainly determine the minimum that a school would have to pay in order to obtain a given game), the available figures at the moment are not very reliable, because all of them

refer to the production of single, or a few, sets of games. Even in the case of "Empire," only 300 game sets were produced. Taking the costs so far incurred, one would certainly conclude that games are costly to produce. One game of "Empire" cost well over $20.00 to make. Here we must remember that the cost of a game has to be distributed over the number of children using it; furthermore, there is every likelihood that quantity production of games will result in significant cost reductions.

Let us turn to the expenditure of time involved in playing a game in the classroom and relate it to the utility of the game as a teaching device. It is probably fair to say that all games take relatively long to play. This is certainly true of "Empire" which takes a minimum of five classroom hours, but can take more. "Trade and Travel" which was thought to be a simple and quick game when first designed turned out to require several classroom hours also; "Adventuring" in its experimental version took a week. In general, it can be said that games take longer to play than the designers think they will, partly because the designers do not realize all the complexities they are building into their games, and partly because of the fragmentation of time that is normal in American schools (announcements, assemblies, etc.), and sometimes because of the teachers' deliberate strategy. If a teacher finds a game successful in motivating children, he may hang all sorts of additional activities on the game in order to achieve the maximum benefit. This of course is perfectly legitimate and even desirable, as long as the children do not get bored with the game. There is evidence that they can and do get bored: in "Trade and Travel" the brighter children became bored after about two sessions of playing, while the slower learners enjoyed the game for several more days. It is therefore important for the teacher to judge how long he should go on with a game (as with any other activity). Quite often, games seem to take more time than the teacher is willing or able to give them. Sometimes he has to stop the game before it is finished. In this case the game cannot be scored (so that no winner is determined) or, if it is scored, the result is meaningless because the game has not been allowed to be completed. This seems to me a far less desirable turn of events than taking extra time to complete the game, since it frustrates the students (taking away the motivational advantage of games, namely, the possibility of "winning" at a classroom

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activity) and diminishes if it does not destroy the educational capacity of the game.

It appears to me that the high point of effectiveness for a game comes usually on the second day of playing. (I am ignoring one-period games, since I have never seen one; all those which supposedly were that quick and easy nevertheless turned out to require several days for playing.) On the second day, the children have learned the rules; they have overcome initial caution induced by a new activity, and they have begun actually to play. They have "got" the point of the game, if it is a good game with a point. After this, from the third day on, the game can easily become boring to bright students or too difficult and lengthy to slower ones. Scoring the game and determining a winner tends to restore interest in the game. If I am right, then the teacher should take advantage of the high level of interest at (or after) the second day for whatever special teaching needs he has in mind. If he starts to emphasize his special point too early, or if he waits too long past the second day of playing, he will not achieve as good results. (Incidentally, it appears that the second day is the high point of playing, even if there is a double class period on either the first or the second day.)

Based on the games I have observed and concerning which I have read reports, it seems possible that slower students can sustain high interest well beyond the second day for simple games, while bright students may be able to do so for complex games if the complexity intrigues them. Neither group, of course, can sustain interest indefinitely for this or any other one activity. Similarly, success with one game in a class clearly does not mean that 100% of classroom time should be devoted to games. Far from it; I would judge (based on the teachers' comments) that one or at most two games during a year constitute the maximum for this sort of activity. Overuse quite obviously will reduce any activity to a routine status.

The Utility of Teaching Games

How useful are games as teaching devices? What kind of teacher can best use them and what kind of student will most benefit from them? These questions cannot be answered categorically, but I think it is safe to say that the answers would be along the following lines.

Games are quite useful as teaching devices, perhaps most so at the junior high school level. In this age group, the competitive spirit is strong, the ability to understand rules is good and the quasi-sophistication of the high school has not yet set in. The utility of games derives very largely from the great motivating force which they exert on students.

A great deal depends on whether a teacher wants to use a game. If he does not, because he does not believe in such "frivolous" activities, or because he cannot adjust to the concomitant noise and confusion, then a game will not succeed; it would be pointless to force a game on such a teacher.

Games will succeed with bright students, as long as they hold their interest (which is probably not much more than two or three days). They will succeed with slower students, as long as they can have fun and enjoy the more relaxed attitude of the classroom.

Games certainly are only one of many teaching devices; they cannot be substituted for all other activities. Not all learning situations are equally adaptable to gaming procedures and it would be folly to try and make a game for an inappropriate situation. Games are not infallible teaching devices; they succeed only to the extent that the teacher understands them and is able to supply additional support for them by means of discussions, questions, readings, and so forth. Much of the success of a good game therefore depends on the teacher. If a teacher who has never used a game wonders whether to try out one in his class, I would encourage him to do so: by actually observing what a game is like he can judge whether his teaching methods are adaptable to it. For the most part, I would guess, if the teacher is willing to accept unorthodox situations and behavior in his class, then he and his students will find the experience rewarding.